

Please type a plus sign (+) inside this box → ☒Approved for use through 09/30/2000. OMB 0651-0032
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.**UTILITY
PATENT APPLICATION
TRANSMITTAL**

(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))

Attorney Docket No. PF990072

First inventor or Application Identifier Yves Maetz, et al.

Title Process for Transmitting and Processing.

Express Mail Label No. EL555973101US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☒ * Fee Transmittal Form (e.g., PTO/SB/17)
(Submit an original and a duplicate for fee processing)
2. ☒ Specification [Total Pages 24]
(preferred arrangement set forth below)
- Descriptive title of the invention
 - Cross References to Related Applications
 - Statement Regarding Fed sponsored R & D
 - Reference to Microfiche Appendix
 - Background of the invention
 - Brief Summary of the invention
 - Brief Description of the Drawings (if filed)
 - Detailed Description
 - Claim(s)
 - Abstract of the Disclosure
3. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets 6]
4. Oath or Declaration [Total Pages 1]
- a. ☒ Newly executed (original or copy)
- b. ☐ Copy from a prior application (37 C.F.R. § 1.63(d))
(for continuations/divisional with Box 16 completed)
- i. ☐ **DELETION OF INVENTOR(S)**
Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

*NOTE FOR ITEMS 1 & 13: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).

ADDRESS TO:Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

5. ☐ Microfiche Computer Program (Appendix)
6. Nucleotide and/or Amino Acid Sequence Submission
(if applicable, all necessary)
- a. ☐ Computer Readable Copy
- b. ☐ Paper Copy (identical to computer copy)
- c. ☐ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

7. ☒ Assignment Papers (cover sheet & document(s))
8. ☐ 37 C.F.R. §3.73(b) Statement of Attorney
(when there is an assignee) ☐ Power of Attorney
9. ☐ English Translation Document (if applicable)
10. ☒ Information Disclosure Statement (IDS)/PTO-1449 ☒ Copies of IDS Citations
11. ☐ Preliminary Amendment
12. ☒ Return Receipt Postcard (MPEP 503)
(Should be specifically itemized)
13. ☐ Small Entity Statement filed in prior application.
Status still proper and desired (PTO/SB-08-12)
14. ☒ Certified Copy of Priority Document(s)
(if foreign priority is claimed)
15. ☐ Other:

16. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment:
- ☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No: _____

Prior application information: Examiner _____

For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

17. CORRESPONDENCE ADDRESS☐ Customer Number or Bar Code Label

(Insert Customer No. or Attach bar code label here)

or ☐ Correspondence address below

Name	Joseph S. Tripoli		
	Thomson Multimedia Licensing Inc.		
Address	Patent Operation		
	Two Independence Way, P. O. Box 5312		
City	Princeton	State	NJ
		Zip Code	08543-5312
Country	USA	Telephone	609/734-9443
		Fax	609/734-9700

Name (Print/Type)	Ronald W. Kurdyla	Registration No. (Attorney/Agent)	26,932
Signature	<i>[Signature]</i>	Date	11-6-00

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

FEE TRANSMITTAL**for FY 2000**

Patent fees are subject to annual revision.

Small Entity payments must be supported by a small entity statement, otherwise large entity fees must be paid. See Forms PTO/SB/09-12.
See 37 C.F.R. §§ 1.27 and 1.28.**TOTAL AMOUNT OF PAYMENT (\$)** 830.00**Complete if Known**

Application Number	
Filing Date	Herewith
First Named Inventor	Yves Maetz, et al.
Examiner Name	
Group / Art Unit	
Attorney Docket No.	PF990072

METHOD OF PAYMENT (check one)

- 1.
- ☒
- The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to:

Deposit Account Number 07-0832

Deposit Account Name THOMSON multimedia Licensing Inc.

- ☒
- Charge Any Additional Fee Required Under 37 CFR §§ 1.16 and 1.17

- 2.
- ☐
- Payment Enclosed:

☐ Check ☐ Money Order ☐ Other**FEE CALCULATION****1. BASIC FILING FEE**

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
101 880	201 345	Utility filing fee	710.00
106 310	206 155	Design filing fee	
107 480	207 240	Plant filing fee	
108 690	208 345	Reissue filing fee	
114 150	214 75	Provisional filing fee	

SUBTOTAL (1) (\$) 710.00**2. EXTRA CLAIM FEES**

Total Claims	Extra Claims	Fee from below	Fee Paid
15	-20** =	X	
Independent Claims	4	-3** =	80.00
Multiple Dependent			

**or number previously paid, if greater; For Reissues, see below

Large Entity Small Entity

Fee Code (\$)	Fee Code (\$)	Fee Description
103 18	203 9	Claims in excess of 20
102 78	202 39	Independent claims in excess of 3
104 260	204 130	Multiple dependent claim, if not paid
108 78	208 39	** Reissue independent claims over original patent
110 18	210 9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$) 80.00**FEE CALCULATION (continued)****3. ADDITIONAL FEES**

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
105 130	205 65	Surcharge - late filing fee or oath	
127 50	227 25	Surcharge - late provisional filing fee or cover sheet	
139 130	139 130	Non-English specification	
147 2,520	147 2,520	For filing a request for reexamination	
112 920*	112 920*	Requesting publication of SIR prior to Examiner action	
113 1,840*	113 1,840*	Requesting publication of SIR after Examiner action	
115 110	215 55	Extension for reply within first month	
116 380	216 190	Extension for reply within second month	
117 870	217 435	Extension for reply within third month	
118 1,360	218 680	Extension for reply within fourth month	
128 1,850	228 925	Extension for reply within fifth month	
119 300	219 150	Notice of Appeal	
120 300	220 150	Filing a brief in support of an appeal	
121 260	221 130	Request for oral hearing	
138 1,510	138 1,510	Petition to institute a public use proceeding	
140 110	240 55	Petition to revive - unavoidable	
141 1,210	241 605	Petition to revive - unintentional	
142 1,210	242 605	Utility issue fee (or reissue)	
143 430	243 215	Design issue fee	
144 580	244 290	Plant issue fee	
122 130	122 130	Petitions to the Commissioner	
123 50	123 50	Petitions related to provisional applications	
126 240	126 240	Submission of Information Disclosure Stmt	
581 40	581 40	Recording each patent assignment per property (times number of properties)	40.00
146 690	246 345	Filing a submission after final rejection (37 CFR § 1.129(a))	
149 690	249 345	For each additional invention to be examined (37 CFR § 1.129(b))	
Other fee (specify) _____			
Other fee (specify) _____			

* Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$) 40.00**SUBMITTED BY**

Name (Print/Type)	Ronald H. Kurdyla	Registration No. (Attorney/Agent)	26,932	Telephone	609-734-9701
Signature		Date	11-6-00		

WARNING

Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

**Process for transmitting and processing an evolutive
abstract in a television system, receiver and transmitter
in such a system**

5

FIELD OF THE INVENTION

The invention is concerned with the field of the management of service information in a television system. The invention relates more particularly to a process for transmitting and a process for processing such service information; it also relates to a transmitter and a receiver for transmitting and receiving this service information in a television system, especially a digital television decoder.

The invention can however be extended to other services such as those present on the WEB.

BACKGROUND

A Man/Machine Interface or MMI provides the television viewer with a means making it possible to consult information typically relating to the programs broadcast.

The information is transmitted by multiplexing appropriate data packets in the digital data stream. A designation often used for this type of data is "Service Information" (or more simply "SI"). In what follows, the term "service" will be used to refer to a series of programs (televised news bulletins, films, shows, etc.) under the supervision of one and the same program provider ("broadcaster" or "service provider").

The service information is broadcast periodically by the service provider. This information describes, among other things, events in respect of a program of a service. These events are parameterized by their names, the service provider associated with them, etc.

It is common practice to associate, with each of the events, information or descriptors summarizing the

content of these events, enabling the user to ascertain the general content of an event by selecting a specific topic from the electronic program guide (EPG) intended for displaying the summaries of events.

5 However, this information or these summary descriptors only advise as to the general content of the relevant event.

10 The aim of the invention is to remedy this problem.

SUMMARY OF THE INVENTION

15 For this purpose, the subject of the invention is a process for transmitting service information in a television system comprising a transmitter and a receiver, wherein it includes the steps, at the level of the transmitter of:

20 - transmitting an event;
 - transmitting versions of an upgradeable summary of the said event, the content of a current version of the summary being dependent on the content of the event occurring since the transmission of the previous version of the summary up to the instant of transmission of the current version of the summary;

25 and at the level of the receiver of:

 - concatenating versions successively received in a memory of the receiver, the upgradeable summary of the said event being the result of the concatenating of the versions.

30

 In this way, if the user wishes to view a summary of the event, the invention enables him to display a summary solely regarding the already broadcast part of the event. Through this advantage of taking into account
35 the time elapsed since the start of the event, the summary thus created is akin to an upgradeable and dynamic summary of an event.

According to one embodiment, the said upgradeable summary is updated as a function of the varying of the content of the event according to one of the following modes:

- periodically, following the occurrence of a particular situation in the content of the event,
- following a command at the level of the transmitter of the event.

According to one embodiment, the step of transmitting the said summary is performed a plurality of times for one and the same update version of the said summary.

According to one embodiment, the content of a version of the summary is referenced with a version number which is incremented with each new version.

According to one embodiment, the said summary is transmitted in a digital stream which includes a summary descriptor identified by a specific identifier.

The subject of the invention is also a process for processing service information using a television receiver, wherein the process includes the steps:

- of receiving an event;
- of receiving versions of an upgradeable summary of the said event, the content of a current version of the summary being dependent on the content of the event occurring since the transmission of the previous version of the summary up to the instant of transmission of the current version of the summary;
- of concatenating versions successively received, the upgradeable summary of the said event being the result of the concatenating of the versions;
- of storing the upgradeable summary in a memory of the receiver.

According to one embodiment, the receiving, concatenating and storing steps are activated by a

request from an application executed in the receiver, the said application being preferentially a user interface.

According to one embodiment, the process includes a step of depicting on depicting means the stored
5 upgradeable summary, following a request from an application.

According to one embodiment, the processing process according to the invention also includes a step of displaying a time indication tied to the latest
10 version received and displayed.

According to one embodiment, the said upgradeable summary is transmitted in a digital stream which includes a summary descriptor identified by a specific identifier.

15 The subject of the invention is also a receiver for receiving service information in a television system, wherein it includes:

- receiving means for receiving events and versions of an upgradeable summary of the said event;
- 20 - means for concatenating versions successively received, the upgradeable summary of the said event being the result of the concatenating of the versions;
- means for storing the upgradeable summary in a memory of the receiver;
- 25 - means for displaying the upgradeable summary.

According to one embodiment, the receiver includes a means of activation enabling the user to activate the means for displaying the upgradeable
summary.

30 According to one embodiment, the receiver includes a means for detecting the receipt of a new version, the said detecting means activating the means for displaying the upgradeable summary upon each new reception.

The subject of the invention is also a transmitter for transmitting service information in a television system, wherein it comprises:

- means for transmitting an event;

5 - means for transmitting versions of an upgradeable summary of the said event, the content of a current version of the summary being dependent on the content of the event occurring since the transmission of the previous version of the summary up to the instant of
10 transmission of the current version of the summary.

BRIEF DESCRIPTION OF THE DRAWINGS

Other characteristics and advantages of the present invention will emerge from the description of the
15 exemplary embodiments which will follow, taken by way of non-limiting examples, with reference to the appended figures in which:

- Figure 1 is a block diagram of a television receiver in accordance with the present exemplary embodiment,
- Figure 2 represents a diagram of classes according to the UML ("Unified Modelling Language") notation matching up various entities within the framework of the invention,
- 25 • Figure 3 represents a diagram of sequences of exchanges taking place between the various entities upon a user request for dynamic summary information, according to a first embodiment of the invention,
- Figure 4 represents a status diagram illustrating the
30 extraction of a dynamic summary descriptor from the DVB stream, according to one embodiment of the invention,
- Figure 5 represents a diagram of sequences of exchanges taking place between the various entities in the mode of permanent requests for extraction of dynamic summary
35 descriptors, according to one embodiment of the invention,

- Figure 6 represents an example of sequencing of information of an event within the framework of a motor race, Figure 7 represents a layout of an "information chart" of the event corresponding to Figure 6 at the start of the race,
- Figure 8 represents the information chart at a moment when the text field of the dynamic summary descriptor has been filled in,
- Figure 9 represents an information chart at a later moment when the text field of the dynamic summary descriptor has again been filled in,
- Figure 10 represents another embodiment for displaying all the dynamic summaries which have been extracted from the demultiplexer.

DETAILED DESCRIPTION

For fuller information on the format and content of service data, MPEG and DVB tables and sections, reference may be made in particular to the following three documents:

EN 300 468 - Specification for Service Information (SI) in Digital Video Broadcast (DVB) systems - V1.3.1 (1998-02),

ISO/IEC 13818-1 (1994) Generic Coding of Moving Pictures and Associated Audio - Recommendation H.220, also known as "MPEG II Systems", and

ETR 211 - Digital Broadcasting systems for television: Implementation guidelines for the use of MPEG-2 systems; Guidelines on implementation and usage of service information.

Figure 1 is a block diagram of a DVB ("Digital Video Broadcasting") type digital television integrated decoder/receiver.

It is quite obvious that the invention is not limited to this physical environment, but may easily be adapted to any other type of transmission of service

data, for example transmission by way of data modulated in the frame flyback interval. Its utilization in network-type (e.g. Internet) environments may also be considered.

5

The decoder of Figure 1 is linked to an antenna 1, itself linked to a tuner 2 of the decoder. The signal provided by the tuner is demodulated by a demodulator 3. The demodulated data are corrected by a corrector circuit 4 and transmitted to a demultiplexer 5.

10 The latter is, for example, a demultiplexer similar to that described in French patent application No. 95 15767 filed on 29 December 1995 in the name of the Applicant. The demultiplexer 5 includes a certain number of filtering registers, referred to as filters by extension, programmed by a microprocessor 23 as a function of the various applications supported by the decoder. The demultiplexer compares the content of the filtering registers with certain parameters of the data packets and loads the data packets corresponding to a positive comparison.

20 For the clarity of the layout, only the most important connections of the microprocessor 23 are illustrated.

25 The audio or video packets or sections filtered by the demultiplexer are stored in predefined areas of a buffer memory 6 pending applications. If necessary, the information is firstly decrypted by a decrypter circuit 7 as a function of the user's entitlements, before being stored in this buffer memory 6.

30 According to the present example, there are five applications: an audio decoder 16, a video decoder 17, a Teletext decoder 18, an access control assembly (comprising the decrypter 7, a verifying microcontroller 8 and an interface for a microprocessor card 9 linked in normal operating mode to a microprocessor card 10), as well as a module for managing the service data 19.

The decoder also includes an infrared interface of a remote control 24, the said interface also being linked to the microprocessor 23. The latter is connected to a memory 12 containing the operating system as well as the resident or downloaded programs for implementing the applications.

A modem 13 linked to the switched telephone network 14 is also controlled by the microprocessor.

A character generator 15 allows the generation of command menus or graphics relating to the parameters of the decoder or to a particular application. The video signal generated by this character generator is multiplexed with one of the video signals originating from the video decoder 17 or from the teletext decoder 18 heading for a first SCART socket linked to a television 22 or a second SCART socket linked to a video recorder 21. The multiplexing circuit 20 is managed by the microprocessor 23.

According to the present exemplary embodiment, the module for managing the service data is physically speaking a program managed by the microprocessor, although conceptually, it involves an application which processes data packets, in the guise of an audio or video decoder, dedicated circuits being used for these data packets.

The module is an interface between the service data (MPEG and DVB tables and sections) and customer applications (program guide, tele-purchasing, interactive games, etc.). It manages the requests of the customer applications and maintains an internal database on the strength of the service data received.

According to the present exemplary embodiment, the customer application is a program guide also managed by the microprocessor.

For further particulars regarding this module 19, and more generally, the relations between the demultiplexer/microprocessor, the module for managing the

service data and the customer application, the reader will be able to refer to French patent application No. 97 15163 filed on 2 December 1997 in the name of the Applicant. In this patent application, it is noted that the management module makes available to the customer applications a certain number of functions intended for formulating the requests relating to the information needed by the application regarding the event summary. The mechanism for managing these requests does not form the subject of the present patent application and will not be made explicit here.

According to one embodiment, the receiver described above is implemented for the receiving of a digital data stream according to the aforesaid DVB standard.

One of the roles of the module for managing service data is to program the filters of the demultiplexer. To fulfil this function and allow fast access to the sought-after data, it maintains an image of the physical structure of the network or networks to which it has access.

The documents EN 300 468 (document I) and ISO/IEC 13818-1 define ten tables giving information on the configuring of the network or networks, bouquets, services and events transmitted. The tables are identified by particular values of packet identification data or "PID" and of table identifiers ("table_id"), whose values are defined by the said documents. Each table contains a version identifier making it possible to determine whether, from one transmission of the table to another, the content of this table has changed.

The table which interests us here is the so-called event information table "EIT". The EIT table includes information on the events within a given service. Four types of EIT table are envisaged, ordered according to their table identifier:

- two tables comprising the information regarding the current and next event of the current transmission channel or another transmission channel ("Transport stream"),
- 5 - two tables comprising the event programming information for the current transmission channel or another channel, for a longer duration.

In what follows, we shall be interested only in the current events of the current transmission channel and in the associated EIT table.

The EIT table contains data relating to events or programs such as event names, event duration, event start times, etc. The use of various descriptors allows the transmission of various types of event information, for example for various types of service. Part 6 entitled "Descriptors" of document I describes the various descriptors which can be used within the SI tables by allocating them a specific address.

Thus, as is apparent from table 12 of part 6, the current event can be described by a certain number of descriptors. This table 12 features a static summary descriptor (or "short_event_descriptor") which will be referred to as the SE descriptor (standing for "Short Event"), which is described in greater detail in paragraph 6.2.27 of document I and which provides a static summary of the current event, namely a general summary of the event.

It is noted that the table identifier values 0X80 to 0XFE are intended for private tables.

According to the invention, a so-called dynamic summary descriptor (or "Dynamic_event_descriptor"), which will be referred to as the DES descriptor (standing for "Dynamic Event Summary") is transmitted by the service provider in the private extensions of the DVB stream, in the current/next EIT table of the current transmission channel.

Using the DVB terminology, this descriptor can be defined as follows:

Syntax	n bits	Mnemonic
DES_descriptor(){		
Descriptor_tag	8	Uimbsbf
Descriptor_length	8	Uimbsbf
ISO_639_language_code	4	Bslbf
Update_version_number	8	Uimbsbf
Update_time	40	Bslbf
Text_length	8	Uimbsbf
For (i=0 to Text_length){		
Text_characters	8	Uimbsbf
}		
}		

5 The descriptor identifier is an 8-bit field which identifies each descriptor. The possible values are described in the document ISO/IEC 13818-1. Since the descriptor identifier values lying between 0x80 and 0xFE are reserved for private descriptors, they could be used
10 for the DES identifier or identifiers. In what follows, it will be assumed that no other private descriptor is used and we will choose, for example, 0x80 as the identifier value for the DES descriptor.

15 The descriptor length is the total number of bytes in the data part of the descriptor.

 The ISO_639 language code identifies the language of the textual data of the descriptor. 'fre', for example, corresponds to the French language.

20 The update version number is the current number of the version of the descriptor. This number is incremented with each modification of the content of the DES descriptor so that the application can decide on the updating of its data cache.

The update time is the time at which the information was updated.

The text length is the number of characters contained in the content of the descriptor, that is to say the number of characters of the text corresponding to the dynamic summary.

According to these definitions, a DES descriptor could have the following form, when transmitting a car race:

```
10      DES_descriptor(){  
        0x80  
        118  
        'fre'  
        1  
15      '18:34'  
        108  
        'After three hours of racing, car No.3 is still  
        in the lead despite the unrelenting attacks of its  
        rivals'.  
20      }
```

As stated earlier, the receiving of this descriptor at the level of the receiver and its extraction by means of specific filters could be implemented by the means described in French patent application No. 97 15163.

Figure 2 represents a class diagram according to the UML notation matching up various entities within the framework of the invention. This modeling makes it possible to specify, depict, produce and document a software system by virtue of a notation which is recognized in the software industry.

Hereafter, the microprocessor/demultiplexer, the management module and the customer application will be grouped together into a single conceptual entity referred to as the "Man/Machine Interface" or MMI, a designation which is well known to the person skilled in the art. Figure 3 represents a diagram of sequences of exchanges

taking place between the various entities upon a user request for dynamic summary information. Figures 2 and 3 elucidate the mechanism for acquiring the DES descriptor following a user request. The class diagram sets up the static aspects of the system { stream, MMI, descriptors, remote control, information menu }, that is to say defines the various entities of the system and their relations. On the other hand, the sequence diagram shows the dynamic aspects of the system, namely the chaining together of function calls. It will be noted that the diagram of Figure 2 includes only the classes required for understanding the operation of the system.

The diagram of Figure 2 includes the "Remote control receiver" class which talks to the "Man/Machine Interface" class. The latter comprises the *InfoKeyPressed* and *OKKeyPressed* methods. The Man/Machine Interface is also connected with the "InfoMenu" class whose attributes are the name of the event *EvtName*, the summary of the event *Summary*, the dynamic summary of the event *DynamicSummary* and the update time *UpdateTime*. The methods which can be called in this class are the methods of display *Display()*, of masking *Mask()*, of defining the name of the event *DefineEvtName(text)*, of summary *DefineSummary(text)*, of dynamic summary *DefineDynamicSummary(text)*, and of update time *DefineUpdateTime(text)*. It is recalled that, in a class diagram, the content of the brackets relating to a method corresponds to the type of the parameters expected as input. Furthermore, the parameters are named. Thus, an exact formulation of a written expression of the method of defining the time could be *DefineTime (integer day, integer month, integer year)*. In a sequence diagram, and also in the code itself, the content of the brackets is called the effective parameter and is expressed for example as *DefineTime(30, 9, 1999)*.

The "Man/Machine Interface" class is also connected with the three classes, "DESDescriptor", "DVB Stream" and "ESDescriptor".

5 The "Descriptor_DES" class has as attributes the version number *Version_Number*, the update time *Update_Time* and the summary *Summary*. These attributes are character strings. The callable methods are the methods calling up the summary *ReturnSummary()*, the version number *ReturnVersionNumber()* and the time of update
10 *ReturnUpdateTime()*.

The "DVB Stream" class exhibits the standby methods for waiting for the static summary descriptor *StandbySummaryDescriptor()* and for waiting for the descriptor of the dynamic summary
15 *StandbyDESSummaryDescriptor()*.

The "ESDescriptor" class includes the event name *EvtName* and summary *Summary* attributes. The methods offered are the methods which return the event name *ReturnEvtName()* and the summary *ReturnSummary()*.

20 The links connecting, on the one hand, the "Man/Machine Interface" class and, on the other hand, the three classes "DESDescriptor", "DVB Stream" and "ESDescriptor" are indicative in particular of the fact that the MMI can call up the methods of the respective
25 classes.

On the other hand, the links connecting the "DESDescriptor" and "ESDescriptor" classes to the "DVB Stream" class are links representing composition relationships, that is to say the DVB stream is composed
30 of the static and dynamic summary descriptors.

According to the embodiment of Figure 3, the microprocessor analyses the information of the stream only when requested by the user.

35 The user selects the "INFO" key of the remote control. The remote control receiver calls up the *InfoKeyPressed* method of the MMI. The MMI calls up the "StandbySummaryDescriptor" and

"StandbyDESSummaryDescriptor" methods of the DVB stream and thus puts itself on standby for the appearance in the DVB stream of the next static and dynamic summary descriptors. These are filtered according to the known methods of the patent application of the Applicant cited above at the level of the demultiplexer in tandem with their order of arrival in the stream.

The MMI then calls up the ReturnEvtName() method of the static summary descriptor which sends back to the MMI the name of the current event in the form of a string of "text" characters. This text is then defined for the information menu by the DefineEvtName(text) method in a first memory 251 of a block of memories 25 of the decoder of Figure 1. The MMI then calls up the ReturnSummary() method which sends back to the MMI the static summary of the current event in the form of a character string. The consequence of this sequence is the recording of this static summary in a memory 252 of the block 25. This text is also defined for the information menu.

In the same way, the MMI calls up the ReturnSummary() method of the dynamic summary descriptor which sends back to the MMI the dynamic summary of the current event in the form of a character string. This dynamic summary is recorded in a third memory 253 of the block 25. This dynamic summary is defined for the information menu by the DefineDynamicSummary(text) method. The version number of the dynamic summary is held locally as described in the Applicant's patent application cited above. The MMI then calls up the ReturnUpdateTime() method which sends back to the MMI the time of the latest update of the dynamic summary. This time is also defined for the information menu and recorded in a fourth memory 254.

The MMI subsequently calls up the Display() method of the InfoMenu class and the information menu displays the name of the current event, its static

summary, its dynamic summary and the time of the latest update at the current time.

When the user no longer wishes to view this latest information, he presses the OK key of the remote control, thereby calling up the OKKeyPressed() method and the MMI calls up the Hide() method of the InfoMenu class. The information menu then no longer displays the summary information.

Figure 4 represents a status diagram illustrating the extraction of a dynamic summary descriptor from the DVB stream.

Upon a user request, the system is standing by to receive an EIT corresponding to the present event of the current transmission channel. If the current transmission channel contains an event information table EIT, the MMI begins to scan in succession the identifier of each descriptor of the table mentioned (table of descriptors corresponding to table 12 part 6 of the document EN 300 468 V1.3.1). So long as this identifier value is not that of a DES_descriptor, the MMI goes to the next descriptor.

When the MMI has found a DES_descriptor, it compares the update version number of the latter with the previous one. If the version number of the descriptor conveyed in the stream is less than or equal to that already stored, the descriptor will not be stored and the descriptor already stored will be retained for possible display. If, on the other hand, the version number of the descriptor extracted from the stream is greater than that already stored, then the dynamic summary text of the extracted descriptor replaces that recorded in the memory 253.

It will be noted that on startup and with each change of event, the VersionNumber field is reinitialized.

Thus, this first embodiment requires fewer resources in particular on the part of the microprocessor, but may induce a delay upon a request

from the user corresponding to the time interval between two successive broadcasts of the DES_descriptor, i.e. around two seconds.

According to a variant represented hereinbelow in Figure 10, the text of the dynamic summary of the extracted descriptor does not replace the text recorded in the memory 254 but is recorded in a memory 255. In a recurrent manner, the content of each descriptor extracted from the DVB stream whose version number is greater than the number of the previous descriptor is recorded in a separate memory; in this way, the dynamic summary display request will display all of the dynamic summaries recorded in each of these memories, as is represented in Figure 10. The dynamic summary corresponding to the concatenation of the partial dynamic summaries described is thus accumulated through successive slices relating to disjoint time intervals of the event.

Figure 5 represents a sequence diagram for the exchanges taking place between the various entities in the mode of permanent requests for extraction of descriptors of dynamic summaries. The micro-processor analyses the information from the stream in continuous mode. This is manifested, in Figure 5, by the fact that the "SummaryDescriptorStandby" and "DESDescriptorStandby" methods are called continuously. The information recovered can be stored in various ways: according to a first mode, the DES is stored temporarily in the buffer memory 6, each dynamic summary being replaced by the next one. According to another mode, all the dynamic summaries of the DES descriptors extracted in a continuous manner are recorded in the said separate memories so as to be able to be displayed when requested by the user.

In this version where the DES descriptors are constantly scanned in the stream, the information relating to the dynamic summary or summaries is

constantly available in the cache memory and can be displayed immediately when requested by the user.

Figure 6 represents an example of sequencing of information of an event within the framework of a motor race.

It is assumed in what follows that the delay between two successive transmissions of the dynamic summary descriptor is small compared with the various steps numbered from ① to ⑥ in Figure 6, that is to say that it is of the order of a second.

The instant ① corresponds to the starting of the event. The content of the text field of the dynamic summary DES_descriptor is empty.

The instant ② corresponds to the moment when the user requests the display of information on the event in progress, the text field of the DES_descriptor not yet having been filled in by the program provider (because, for example, the race has not begun). The user then sees the content of the static summary return to the screen, as represented in Figure 7.

The moment ③ identifies the start of the race. After the first lap, the program producer decides that the action which has just unfurled justifies the updating of the dynamic summary. He fills in the text field of the DES_descriptor of the summary of the actions which have unfurled in the interval and broadcasts the latter in the DVB stream.

The user having been away between the instants ③ and ④, he requests the displaying of information on the event in progress. On his screen, he then views the information chart represented in Figure 8. The latter comprises the name of the event "Motor race", the static summary SE and the dynamic summary DES1, respectively corresponding to the respective contents of the memories 251, 252 and 253 at the instant ④.

A development takes place at the instant ⑤ and the producer updates the content of the DES_descriptor broadcast.

Thus, the user requesting the display of summary
5 information at an instant ⑥ subsequent to ⑤, will view an updated dynamic summary DES2, as represented in Figure 9.

According to another embodiment represented in Figure 10, following a user request for summary
10 information, the character generator 15 transmits the content of all the memories including the various dynamic summaries extracted in continuous mode, each dynamic summary being accompanied by the time of extraction of this summary from the stream.

15 According to an embodiment which is not described, an index is displayed on the television screen of the user viewing a televised event when a dynamic summary descriptor is extracted from the DVB stream or stored in a specific memory. The user is thus warned of
20 the reception of this information and of its updating.

The subject of the invention is also a transmitter for transmitting the DES_descriptor and ESdescriptor descriptors described hereinabove. This transmitter, not illustrated, comprises, according to one
25 embodiment, a multiplexer multiplexing the descriptors in the data stream. This transmitter comprises:

- means for transmitting an event;
- means for transmitting an upgradeable summary

of the said event, the content of the said summary being
30 dependent on the content of the event occurring at the latest up to the instant of transmission of the said summary.

The invention is of course not limited to the
35 embodiments described.

Thus, following a user request to display a dynamic summary, the displaying has been described of a

static summary, of one or more dynamic summaries, possibly jointly with their times of extraction from the stream. Any other information accompanying the dynamic summary of an event may be contemplated within the framework of the invention.

It has also been noted that the appearance of new dynamic summaries depends on the importance accorded to the current event. It is however possible to conceive of the transmitting of new dynamic summaries being carried out according to a fixed periodicity.

It should be noted that the invention is not limited solely to the transmission of data by satellite, over the airwaves or by cable, but can be implemented in any system where data or data packets appear periodically in the data stream. This is the case in particular for recorded or prerecorded data streams.

On the other hand, although the examples given relate most particularly to service data, it is clear that the invention is not limited to this type of data. So-called private data can, for example, be processed in a similar manner.

CLAIMS

1. Process for transmitting service information in a television system comprising a transmitter and a receiver, wherein it includes the steps, at the level of the transmitter of:

- transmitting an event;
- transmitting versions of an upgradeable summary of the said event, the content of a current version of the summary being dependent on the content of the event occurring since the transmission of the previous version of the summary up to the instant of transmission of the current version of the summary;

and at the level of the receiver of:

- concatenating versions successively received in a memory of the receiver, the upgradeable summary of the said event being the result of the concatenating of the versions.

2. Process according to Claim 1, wherein the said versions of the upgradeable summary are transmitted as a function of the varying of the content of the event according to one of the following modes:

- periodically, following the occurrence of a particular situation in the content of the event,
- following a command at the level of the transmitter of the event.

3. Process according to claim 1, wherein the said versions are transmitted in a digital stream which includes a version descriptor identified by a specific identifier.

4. Process for processing service information using a television receiver, wherein the process includes the steps:

- of receiving an event;
- of receiving versions of an upgradeable summary of the said event, the content of a current version of the summary being dependent on the content of the event

occurring since the transmission of the previous version of the summary up to the instant of transmission of the current version of the summary;

- of concatenating versions successively received, the upgradeable summary of the said event being the result of the concatenating of the versions;
- of storing the upgradeable summary in a memory of the receiver.

5. Process according to Claim 4, wherein the receiving, concatenating and storing steps are activated by a request from an application executed in the receiver, the said application being preferentially a user interface.

6. Process according to Claim 4, wherein it includes a step of depicting on depicting means the stored upgradeable summary, following a request from an application.

7. Process according to Claim 6, wherein the process includes a step of displaying a time indication tied to the latest version received and displayed.

8. Process according to Claim 6, wherein the step of depicting the upgradeable summary is performed upon each receipt of a new version, so that the depicting means permanently depict the latest upgradeable summary stored.

9. Receiver for receiving service information in a television system, wherein it includes:

- receiving means for receiving events and versions of an upgradeable summary of the said event;
- means for concatenating versions successively received, the upgradeable summary of the said event being the result of the concatenating of the versions;
- memory for storing the upgradeable summary in the receiver;
- display circuits for displaying the upgradeable summary.

10. Receiver according to Claim 9, wherein it includes a means of activation enabling the user to

activate the means for displaying the upgradeable summary.

11. Receiver according to Claim 10, wherein it includes a detector to detect the receipt of a new version, the said detector activating the display circuit for displaying the upgradeable summary upon each new reception.

12. Transmitter for transmitting service information in a television system, wherein it comprises:

- means for transmitting an event;
- means for transmitting versions of an upgradeable summary of the said event, the content of a current version of the summary being dependent on the content of the event occurring since the transmission of the previous version of the summary up to the instant of transmission of the current version of the summary.

13. Transmitter according to Claim 12, wherein the means for sending the versions of the upgradeable summary are activated as a function of the varying of the content of the event according to one of the following modes:

- periodically, following the occurrence of a particular situation in the content of the event,
- following a command at the level of the transmitter of the event.

14. Transmitter according to Claim 12, wherein it includes a means for sending a version number associated with each version of the summary, the values of the numbers of two consecutive versions being consecutive.

15. Transmitter according to Claim 13, wherein it includes a means for sending a version number associated with each version of the summary, the values of the numbers of two consecutive versions being consecutive.

Abstract

**Process for transmitting and processing an evolutive
abstract in a television system, receiver and
transmitter in such a system**

5

The invention relates to a process for transmitting service information in a television system. The invention relates more particularly to the providing of an upgradeable summary tied to the broadcasting of an event. Versions of the summary are transmitted at certain moments in the service information. These versions are concatenated in the receiver so that the result of the concatenation constitutes a summary of that part of the event which has already been broadcast.

The invention also relates to a receiver for receiving service information in such a television system, to the process for processing this service information at the level of this receiver and to the transmitter implementing the transmission process according to the invention.

25 Figure 4

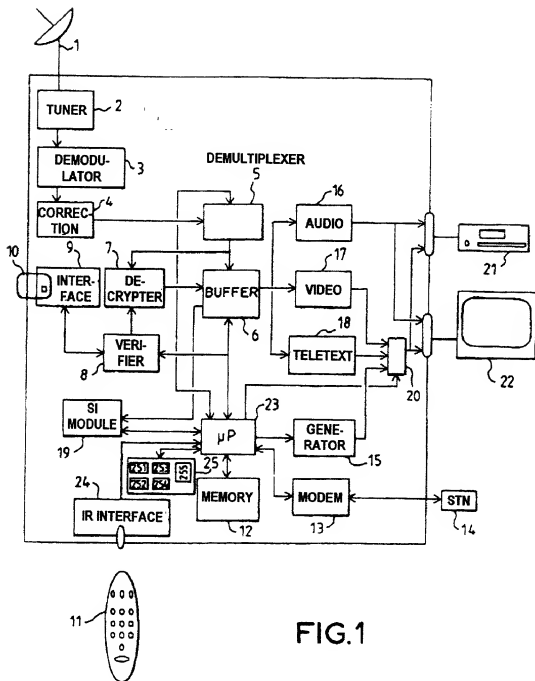


FIG.1

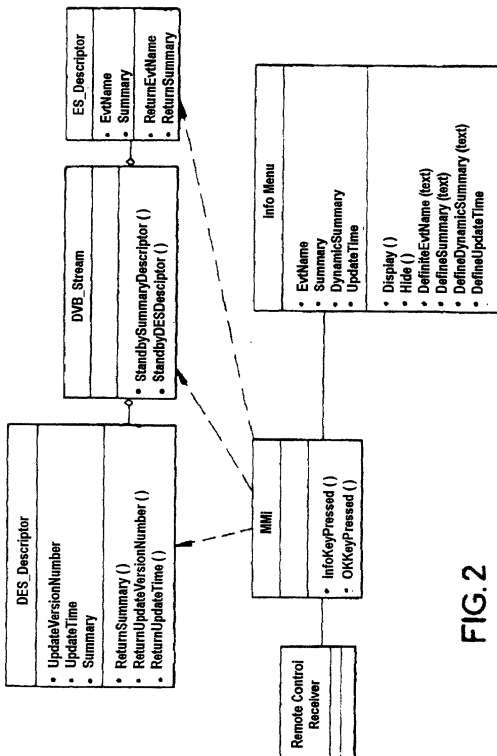


FIG.2

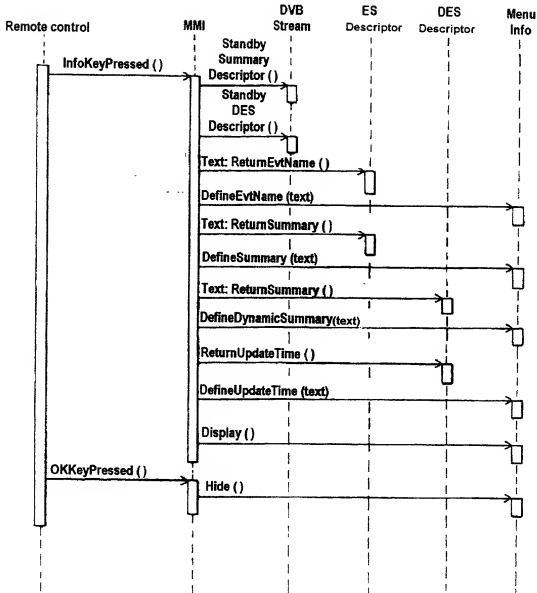
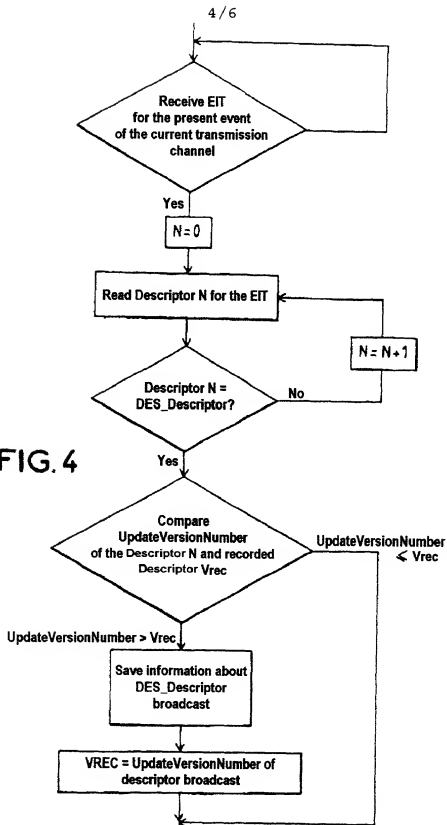


FIG.3

FIG. 4



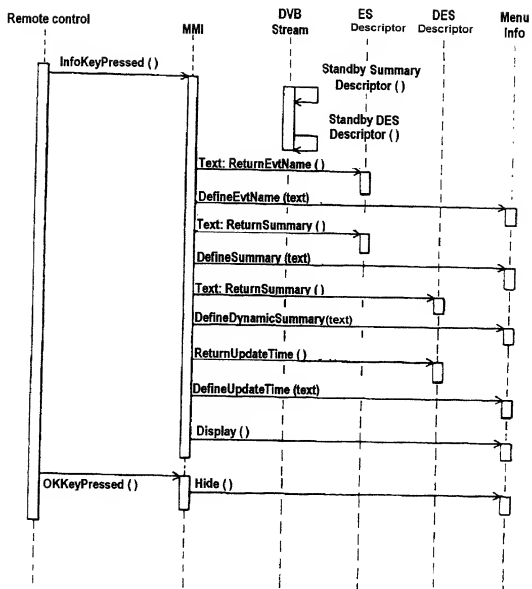


FIG.5

Event	223					
Action	①	②	③	④	⑤	⑥
Updated version number	0	1			2	
Content of the text field of the dynamic summary	Empty	DES 1			DES 2	

FIG. 6

Motor race
Static summary

FIG. 7

Motor race
Static summary
DES 1

FIG. 8

Motor race
Static summary
DES 2

FIG. 9

Motor race
Static summary
DES 1 : 20 h 42
DES 2 : 20 h 55

FIG. 10

DECLARATION FOR UNITED STATES PATENT APPLICATION,
POWER OF ATTORNEY, DESIGNATION OF CORRESPONDENCE ADDRESS

As a below named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name, and that I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

PROCESS FOR TRANSMITTING AND PROCESSING AN EVOLUTIVE ABSTRACT IN A
TELEVISION SYSTEM, RECEIVER AND TRANSMITTER IN SUCH A SYSTEM

the specification of which
(CHECK ONE) (xx) is attached hereto.
() was filed on _____, Application Serial. No. _____
and was amended on _____.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with 37 CFR 1.56(a).

I hereby claim foreign priority benefits under 35 USC 119 of any foreign application(s) for patent, utility model, design or inventor's certificate having a filing date before that of the application(s) on which priority is claimed:

Prior Foreign Application(s)			Priority Claimed	
Number	Country	Date Filed	Yes	No
9914134	FR	November 10, 1999	xx	

I hereby claim the benefit under 35 USC 120 of any US Application(s) listed below, and, insofar as the subject matter of each of the claims of this Application is not disclosed in the prior US application in the manner provided by the first paragraph of 35 USC 112, I acknowledge the duty to disclose information which is material to the examination of this application in accordance with 37 CFR 1.56(a).

Serial No.: _____ Filed: _____

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under of 18 USC 1001 and that such wilful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby appoint the following attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith: Joseph S. Tripoli (Reg. No. 26,040), Dennis H. Irlbeck (Reg. No. 26,372), Eric Herrmann (Reg. No. 29,169) and Joseph J. Laks (Reg. No. 27,914) Telephone: (609) 734-9813.

Address all correspondence to Joseph S. Tripoli, Patent Operations - Thomson multimedia Licensing, Inc. - CN 5312 - Princeton, New Jersey 08543-0028.

Signature:  Date: 26 day of October, 2000.

Sole or First Joint Inventor: Yves Maetz

Citizenship: FR

Residence and Post Office Address:

7 Square du Roi Tristan
F- 35620 Melesse
France

Signature: 
Second Joint Inventor: Nour-Eddine Tazine

Date: 26 day of October, 2000.

Citizenship: FR

Residence and Post Office Address:

22, rue des clos blancs
F-35530 Noyal sur Vihaine
France